THEORY OF COMPUTATION

1. Ambiguous grammar is NOT accepted by

(a) Regular language
(b) DCFL
(c) CFL
(d) Recursive language

2. How many two state DFA's exists over alphabet (0, 1) where X and Y are two states and X is always initial state, Y is always final.

(a) 16
(b) 20
(c) 32
(d) 64

3. How many DFA's exist over alphabet (0, 1) of two states X and Y where both states are always non-final?

(a) 16
(b) 20
(c) 32
(d) 64

4. Which one of the following is False?

I. A DFA can contain one initial state and one final state
II. A NFA can contain many initial states and many final states
III. A DFA can contain many initial states and many final states
IV. A NFA can contain one initial state and many final states

(a) I, II
(b) II, III
(c) I, IV
(d) III, IV

5. $L = \{0^{n+m}\ 1^{n+m}\ 0^{m} \mid n, m \geq 0\}$

The above language is

(a) CFL but not regular
(b) CSL but not CFL
(c) RE but not CSL
(d) none of the above

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6. $L_1 = \{(xy)^m (yz)^m, m \geq 1\}$
$L_2 = \{a^m b^n c^k \mid m>n \text{ or } m<n\}$

Which of the following is True?

(a) L_1 is CFL, L_2 is DCFL
(b) L_1 is DCFL, L_2 is CFL
(c) Both L_1, L_2 are CFLs
(d) Both L_1, L_2 are DCFLs

7. How many total numbers of substrings are possible out of the string abbbccd?

(a) 25
(b) 27
(c) 28
(d) 29

8. $L = \{x^a y^a : a \geq 1\}$

I. L^3 is context free.
II. $\lceil \sqrt{L} \rceil$ is not context free.

Which of the following is correct?

(a) I only
(b) II only
(c) Both I and II
(d) None of the above

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